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U. S. Department of Agriculture, Forest Service

# FOREST PRODUCTS LABORATORY

In cooperation with the University of Wisconsin

MADISON, WISCONSIN

List of Publications on  
KILN DRYING, PHYSICAL PROPERTIES OF WOOD  
AND WOOD STRUCTURE

April 1921



READ THESE GENERAL INSTRUCTIONS!

This List is grouped as follows:

<u>Publications on Seasoning and Physical Properties</u>	Page
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The laboratory keeps on hand, for free distribution, copies of all the mimeographed circulars, reprints, and technical notes on this list. Blanket requests or requests for large numbers of any individual article will not be filled except in special cases.

The laboratory does not have the government bulletins and circulars available for general distribution. These can be secured (except when out of print) from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the prices listed. Postage stamps, foreign money, and uncertified checks will not be accepted by the Superintendent.

The bibliography of published articles is presented as an index only. None of these articles are available for distribution at the laboratory, except certain ones which are included in the lists of mimeographed circulars and reprints.





PUBLICATIONS ON SEASONING AND  
PHYSICAL PROPERTIES

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Mimeographed Circulars  
and Reprints.

Automatic Regulation of Humidity in Factories.

Brain Work in Kiln Operation.

Brief Synopsis in Regard to the Kiln Drying of Oak for  
Wagon Stock; Including Mention of Hickory, Elm, Birch,  
and Maple.

Calculation of Steam Consumption in Drying One-inch Doug-  
las Fir in Forest Service Superheated Steam Dry Kiln.  
Care of Airplane Wood.

Design for Forest Service Superheated Steam Dry Kiln.

Determining Moisture Content of Wood.

Discussion of Specifications for Kiln Drying Wood for Air-  
plane Uses.

Drying Lumber by Means of Superheated Steam.

Drying of Plywood Panels.

Drying Schedules for Hardwoods for Furniture and General  
Interior Use.

Effect of Kiln Drying on the Strength of Airplane Woods.  
Eucalyptus Lumber.

Experiments in Kiln Drying Southern Yellow Pine.

Factors Affecting the Strength of Wooden Members.

General Kiln-Drying Process for Seasoning Certain Kinds  
of Lumber Without Reduction in Strength Properties.

Handling, and Storing, and Care of Spruce Airplane Stock.  
How to Determine Relative Humidity.  
How to Measure Conditions in Seasoned Lumber.

Inadequacy of Visual Inspection in Kiln Drying.

Information for Dry Kiln Operators on Drying Hardwoods and  
Softwoods.

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1. The first step is to identify the problem or goal. This involves understanding the current situation, identifying the problem, and setting a clear goal. The goal should be specific, measurable, achievable, relevant, and time-bound (SMART).

10-10-68

Kiln Drying of Artillery Wheel Stock.

Kiln Drying of Red Gum.

Kiln Drying Systems Compared; Relative Virtues of Progressive and Compartment Methods.

Kiln Drying of Woods for Airplanes.

Notes on the Operation of the Forest Service Water Spray  
Dry Kiln and Theoretical Considerations of Heat Relations.

Proper Drying Demands Good Circulation.

Recording Thermometers.

Relation of Moisture Content and Drying Rate of Wood to Humidity of the Atmosphere.

Rules for Piling Lumber for Air Seasoning to Avoid Deterioration.

Sap-Stain and Molds on Lumber.

Schedules for Drying Softwoods.

Shrinking and Swelling of Wood.

Shrinkage of Interior Trim; Its Cause and Prevention.

Steaming Lumber Before and During Kiln Drying.

Stresses and Detection of Casehardening During Kiln Drying.

Suggestive Specifications for Kiln Drying Process for Seasoning Woods to be Used in the Manufacture of Furniture and Similar Products Where Maximum Strength of the Wood is of Secondary Consideration.



Technical Notes

- A-1 Hints on Storing Lumber to Prevent Decay.
- D-1 Steaming of Vehicle Stock During Kiln Drying.
- F-1 Foreign Trade in Furniture.
- D-3 Built-up Artificial Limb Blanks.
- D-4 Circulation and Piling in the Dry Kiln.
- D-5 Correct Moisture Content of Lumber.
- D-7 Quarter-Saved Oak Chair Posts at Plain-Saved Prices.
- D-8 Coatings that Prevent End Checking.
- F-8 Moisture Content of Wood at Different Humidities.
- D-9 Flat Panels and No Surface Checks by Maximum-Humidity Method.
- D-10 Piling Oak Dimension to Reduce Season Checks.
- B-11 Method of Determining Moisture Content of Wood.
- B-12 Shrinkage in So-Called "Compression Wood".
- D-12 Uneven Coatings on Wood Cause Warping.
- D-13 Casehardened Lumber and Warped Products.
- D-14 How to Accomplish Rapid Kiln Drying.
- B-15 Average Weights of Various Species of Wood.
- D-15 A Drying Schedule for Air-Seasoned Oak.
- F-24 Moisture Absorption Through Varnish Same for Different Species of Wood.
- F-27 Comparison of Moisture Resistance Tests for Coatings.
- F-33 Comparative Durability of Green and Seasoned Timber.
- 85 Shrinkage of Veneer from Boiled and Steamed Logs.
- 89 Moisture Content of Wood is Independent of Density.
- 90 Kiln Drying of Green Hardwoods Requires Mechanically Perfect Heating System.
- 107 Drying Periods for Various Woods.
- 111 Drying by Superheated Steam.
- 112 How to Tell When Lumber is Ready to Remove from the Kiln.
- 121 Automatic Humidity Control in Shops.
- 124 Materials Used in Dry Kiln Construction.
- 127 Smoke Making Device for Testing the Circulation in Dry Kilns.

1911

Jan 1st - New Year's Day  
Feb 1st - Valentine's Day  
Mar 1st - St. Patrick's Day  
Apr 1st - Good Friday  
May 1st - Mother's Day  
Jun 1st - Father's Day  
Jul 1st - Independence Day  
Aug 1st - Labor Day  
Sep 1st - National Day  
Oct 1st - Halloween  
Nov 1st - Thanksgiving  
Dec 1st - Christmas



Government Bulletins and Circulars

	<u>Date of Issue</u>
Manual of Design and Installation of Forest Service Water Spray Dry Kiln; U.S.D.A. Bulletin 894 - 10 cents.	Oct. 18 1920
Relation of the Shrinkage and Strength Properties of Wood to its Specific Gravity; U.S.D.A. Bulletin 676 - 10 cents.	July 16 1919
Materials for the Household; Bureau of Standards Circular 70 (Contains a chapter on Wood) - 25 cents.	Dec. 5 1917
The Seasoning of Wood; U.S.D.A. Bulletin 352 - 10 cents.	July 9 1917
Timber Storage Conditions in the Eastern and Southern States with Reference to Decay Problems; U.S.D.A. Bulletin 510 - 20 cents.	May, 1917
The Theory of Kiln Drying; U.S.D.A. Bulletin 509 - 5 cents.	Mar. 1917
<sup>1</sup> Density of Wood Substance and Porosity of Wood; Journal of Agricultural Research.	Sept. 21, 1914
Principles of Drying Lumber at Atmospheric Pressure and Humidity Diagram; F.S. Bulletin 104 - 5 cents.	Dec. 16, 1912
<sup>1</sup> The Specific Heat of Wood; F.S. Bulletin 110.	Sept. 20, 1912
Strength of Wood as Influenced by Moisture; F.S. Circular 108 - 5 cents.	1907
Effect of Moisture on the Strength and Stiffness of Wood; F.S. Bulletin 70 - 15 cents.	1906
Timber, Elementary Discussion of Characteristics and Properties of Woods of North America; F.S. Bulletin 10 - 10 cents.	1895

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<sup>1</sup>Out of print.





Other Publications

The Kiln Drying of Lumber - by H. D. Tiemann, Third Edition, 1920. Obtainable from H. D. Tiemann, Forest Products Laboratory, Madison, Wisconsin, or from the publishers, J. B. Lippincott & Co., Philadelphia. \$4.50 Net.

The Kiln Drying of Lumber - Correspondence-Study Course given by the Extension Division of the University of Wisconsin, Madison, Wisconsin. \$5.00.

Timber, Its Strength, Seasoning, and Grading - H.S. Betts, 1919. Obtainable from H. S. Betts, Forest Service, Washington, D. C., or from the publishers, McGraw-Hill Book Co., New York. \$3.10.



BIBLIOGRAPHY OF PUBLISHED ARTICLES

Seasoning

Title	Author	Where Published:	Date
Proper Drying Demands Good Circulation	Thelen, Rolf	Hardwood Record	March 10, 1921
Steaming Lumber Before and During Dry Kilning	Loughborough, W. Karl	Sash-Door-Finish	March, 1921
Kiln Drying Systems Compared	Tiemann, H. D.	Hardwood Record	Sept. 10, 1920
Drying Lumber by Means of Superheated Steam	Tiemann, H. D.	Southern Lumberman Timberman	May 1, 1920 May, 1920
Drying of Plywood Panels	Brewster, D. R.	Furniture Mfr. and Artisan Hardwood Record	May, 1920 July 25, 1920
An Analogistic Explanation of Caschardening	Tiemann, H. D.	Jour. of Franklin Institute	May, 1920
Scientific Kiln Drying	Anonymous	Canadian Woodworker	May, 1920
Good and Bad in Kiln Drying	Sweet, C. V.	Southern Furniture Mfrs. Ass'n.	March, 1920
Shrinking and Swelling of Wood	Koehler, Arthur	Furniture Mfr. and Artisan	March, 1920
Automatic Regulation of Humidity in Factories	Knauss, A. C.	Scientific American Monthly	Jan., 1920
Kiln Drying of Woods for Airplanes	Tiemann, H. D.	National Advisory Committee for Aeronautics	1920



Seasoning (continued)

Title	Author	Where Published	Date
The Effect of Kiln Drying on the Strength of Airplane Woods	Wilson, T.R.C.	National Advisory Committee for Aeronautics	1920
Recording Thermometer	Tiemann, H. D.	Hardwood Record	Dec. 25, 1919
Steaming Lumber During Kiln Drying	Pomeroy, L. K.	Hardwood Record	Dec. 10, 1919
Determining Moisture Content of Wood	Pomeroy, L. K.	Hardwood Record	Nov. 10, 1919
Detecting Casehardening and Stresses in Kiln Drying	Teesdale, L.V.	Hardwood Record	Nov. 10, 1919
Moisture in Wood and Surrounding Air	Eckbo, N. B.	Hardwood Record	Oct. 25, 1919
How to Determine Relative Humidity	Teesdale, L.V.	Hardwood Record	Sept. 25, 1919
Relation of Moisture Content and Drying Rate of Wood to Humidity of Atmosphere	Koehler, Arthur	American Lumberman	July 12, 1919
Preventing Shrinkage of Interior Trim	Teesdale, L.V.	House Beautiful Building Age Am. Architect	Sept. 19 July, 19 July, 19
Schedules for Drying Hardwoods	Brewster, D.R.	Sash-Door-Finish Hardwood Record	Feb. 1921 July 10, 1919 Aug. 10, 1919
The Phenomena of Drying Wood	Tiemann, H. D.	Jour. of Franklin Institute	July, 19
Inadequacy of Visual Inspection in Kiln Drying	Tiemann, H. D.	Aviation and Aeronautical Engineering	June 18, 1919



Seasoning (Continued)

Title	Author	Where Published	Date
Kiln Drying Specifications for lumber	Tiemann, H. D.	Sci. Am. Supp.	Aug. 16, 1919
		Hardwood Record	June 10, 1919
Proper Care of Airplane Wood	Hallauer, F. J.	Timberman	June, 1919
Brain Work in Kiln Operation	Sweet, C. V.	West Coast Lumberman	June 1, 1919
		Hardwood Record	May 10, 1919
How to Dry Red Cedar to Avoid Collapse	Tiemann, H. D.	West Coast Lumberman	Mar. 15, 1919
Experiment in Kiln Drying Southern Yellow Pine	Imrie, J. E.	Am. Lumberman	Sept. 1, 1917
		St. Louis Lumberman	Sept. 1, 1917
		Lumber Trade Journal	Sept. 1, 1917
Measuring Conditions in Seasoned Lumber	Imrie, J. E.	So. Lumberman	Mar. 10, 17
		Hardwood Record	" "
		Am. Lumberman	" "
		Lumber Trade Journal	Mar. 15, 17
Drying in Superheated Steam	Tiemann, H. D.	Lumber World Review	Aug. 10, 1916
The Casehardening of Wood	Tiemann, H. D.	Lumber World Review	July 10, 1916
The Circulation in Dry Kilns; Parts 1, 2, 3, and 4	Tiemann, H. D.	Lumber World Review	May 10, 1916 to Aug. 10, 1916







Seasoning (Continued)

Title	Author	Where Published:	Date
Kiln Drying of Gum	Imrie, J. E.	Am. Lumberman	Jan. 22
		So. Lumberman	Jan. 22
		Hardwood Record	Jan. 25
		Am. Furniture	1916
		Mfg.	
Conditions Which Exist in Casehardened Wood	Imrie, J. E.	Hardwood Record	Nov. 10
		Am. Lumberman	Nov. 13,
			1915
Discoloration of Maple in the Kiln	Judd, Roy C.	Jour. Ind. & Eng. Chem.	Nov., 1915
The Kiln Drying of Lum- ber	Tiemann, H. D.	St. Louis Lum- berman	Nov. 1
		Am. Lumberman	Oct. 30
		So. Lumberman	Oct. 29,
			1915
Problems in Kiln Drying Lumber	Tiemann, H. D.	Lumber World Review	Sept. 25, 1915
Improvement in Forest Service Humidity Regu- lated Dry Kiln	Tiemann, H. D.	Am. Lumberman	Sept. 1
			Sept. 5
		Hardwood Record	Sept. 25,
			1915
Effect of Different Methods of Drying on the Strength of Wood.	Tiemann, H. D.	Lumber World Review	Apr. 10, 1915
How to Dry Western Larch	Tiemann, H. D.	West Coast Lum- berman	Mar. 1, 1915
Principles of Kiln Dry- ing Lumber, Part 1	Tiemann, H. D.	Lumber World Review	Jan. 25 Feb. 10
Part 2			Feb. 25 1915

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*Journal of Management Inquiry* 18(6)

1990

*Journal of Management Studies*, 1986, 23(1), 7-10.

*Journal of Management Education* 30(6)

Seasoning (Continued)

Title	Author	Where Published	Date
Kiln Drying Lumber and a Discussion of the Whole Problem -- A New Kiln	Tiemann, H. D.	Lumber World Review	Mar. 10, 1914
Air Seasoning of Timber -- From paper contributed to Bul. 161, American Ry. Eng. Ass'n.	Kempfer, W. H.	Railway Review	Jan. 10, 1914
Kiln Drying of Lumber Scientifically Considered	Tiemann, H. D.	American Lumberman	Nov. 15, 1913
Is Eucalyptus Suitable for Lumber?	Tiemann, H. D.	Proc. Soc. of Am. Foresters	Oct., 1913
Eucalyptus Lumber. Part 1. To What Extent is California Grown Eucalyptus Suitable for Lumber? 2. Results of Experiments in Drying Blue Gum and Other Species	Tiemann, H. D.	Hardwood Record	Sept. 25, '13

Physical Properties

Microscopy of Pulp and Paper Woods	Gerry, Eloise	Paper	Apr. 21, 1920
Selecting Wood for Airplanes	Koehler, Arthur	Scientific Am. Supplement	Sept. 6, 1919
Effect of Moisture and Other Extrinsic Factors on the Strength of Wood	Tiemann, H. D.	Society of Am. Foresters Proceedings - '07	1907

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PUBLICATIONS ON WOOD STRUCTURE

Mimeographed Circulars & Reprints

- "Grain" of Wood with Special Reference to the Direction of the Fibers  
How to Distinguish Douglas Fir From Sitka Spruce  
How to Separate Black Ash from Commercial White Ash Lumber  
Identification of True Mahogany and Certain So-Called Mahoganies  
Key for the Identification Without the Aid of a Hand Lens of Native Woods Used for Chairs and Other Furniture.  
~~Key for the Identification Without the Aid of a Hand Lens of Woods Used for Box and Crate Construction~~

Technical Notes

- D-2 How to Distinguish Douglas Fir from Sitka Spruce Lumber  
D-11 How to Distinguish Black Ash from Commercial White Ash Lumber  
95 The Length of Wood Fibers  
103 How to Distinguish Mahogany and Walnut from Red Gum  
116 How to Tell Birch, Beech and Maple Apart  
125 Identification of Oak Woods

Government Bulletins and Circulars

- |  | Date of Issue |
|--|---------------|
| Guidebook for the Identification of Woods Used for Ties and Timbers; Misc. F.S. Bulletin, 30 cents.                      | Oct., 1917    |
| Tyloses: Their Occurrence and Practical Significance in Some American Woods; Journal of Agricultural Research; 25 cents. | May 25, 1914  |
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American Storax Production: Results of Different Meth- ods of Tapping Red Gum Trees	Gerry, Eloise	Journal of For- estry	Jan., 1921
Production of American Storax	Mahood, S. A. Gerry, Eloise	Druggists Cir- cular	Jan., 1921
Bordered Pits in Douglas Fir: A Study of Position of Torus in Mountain and Lowland Species in Rela- tion to Creosote Penetra- tion	Griffin, G.J.	Journal of For- estry	Nov., 1919
The "Grain" of Wood With Special Reference to the Direction of the Fibers	Koehler, Art.	Aerial Age Week- ly West Coast Lum- berman Scientific Am. Supplement	Aug. 12, 1918 July 15, 1918 Sept. 7, 1918
Proper Methods of Turpen- tining. Increased Yield Obtained Without Serious Injury to the Tree	Gerry, Eloise	Scientific Am. Supplement	Sept. 15, 1917
A Plea for Closer Discrim- ination in the Use of the Words "Grain" and "Texture" with Respect to Wood	Koehler, Art.	Hardwood Record	Feb. 25, 1917
Fiber Measurement Studies. A Comparison of Tracheid Dimensions in Longleaf Pine and Douglas Fir, with Data on the Strength and Length, Mean Diameter and Thickness of Wall of Trach- eids	Gerry, Eloise	Science	Mar. 10, 1916





Title	Author	Where Published	Date
The Structure of Wood and Some of its Properties and Uses	Gerry, Eloise	N. Hem. & Hard-wood Ass'n.	Jan., 1916
Chemistry as an Aid in Identification of Species	Schorger, A. W.	Proc. Soc. of Am. Foresters	Jan., 1916
Wood Older than the Hills	Koehler, Art.	Am. Lumberman	Dec. 25, 1915
		Am. Forestry	Feb., 1916
A Visual Method of Distinguishing Longleaf Pine	Koehler, Arthur	Am. Lumberman Engineering Rec.	Sept. 11, 1915 Sept. 11, 1915
Fiber Measurement Studies Length Variations; Where They Occur and Their Relation to the Strength & Uses of Wood	Gerry, Eloise	Science	Jan. 29, 1915
An Improved Method of Infiltrating Wood With Celloidin	Koehler, Arthur	Proc. Soc. Am. Foresters	April, 1914
Microscopic Structure of Woods in Relation to Properties	Gerry, Eloise	Proc. Soc. of Am. Foresters	July, 1913
Microscopic Work of the Laboratory of Forest Products on the Structure of Wood	Tiemann, H. D.	Am. Forestry	April, 1911

THE  
OFFICE OF THE  
SECRETARY OF THE  
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WASHINGTON, D. C.  
JANUARY 10, 1900  
MEMORANDUM FOR THE SECRETARY OF THE NAVY  
FROM THE SECRETARY OF THE NAVY

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OTHER LISTS OF PUBLICATIONS

Government and State Bulletins on the Marketing of Wood-  
lark Products  
Price List of Government Bulletins and Circulars on For-  
estry; Tree Planting, Wood Tests, and Lumber Indus-  
tries  
Publications on Wood Preservation  
Publications on Glue, Plywood, and Coatings  
Publications on Derived Products  
Publications on the Mechanical Properties of Timber  
Publications on Pulp and Paper  
Short List of Books on Wood  
Short List of Government Publications on Wood and Trees,  
Each Covering a Large Number of Species  
State Wood-Using Industry Reports

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